

5-2 Skills Practice**Polynomials**

Determine whether each expression is a polynomial. If it is a polynomial, state the degree of the polynomial.

1. $x^2 + 2x + 2$

2. $\frac{b^2c}{d^4}$

3. $8xz + \frac{1}{2}y$

Simplify.

4. $(g + 5) + (2g + 7)$

5. $(5d + 5) - (d + 1)$

6. $(x^2 - 3x - 3) + (2x^2 + 7x - 2)$

7. $(-2f^2 - 3f - 5) + (-2f^2 - 3f + 8)$

8. $(4r^2 - 6r + 2) - (-r^2 + 3r + 5)$

9. $(2x^2 - 3xy) - (3x^2 - 6xy - 4y^2)$

10. $(5t - 7) + (2t^2 + 3t + 12)$

11. $(u - 4) - (6 + 3u^2 - 4u)$

12. $-5(2c^2 - d^2)$

13. $x^2(2x + 9)$

14. $2q(3pq + 4q^4)$

15. $8w(hk^2 + 10h^3m^4 - 6k^5w^3)$

16. $m^2n^3(-4m^2n^2 - 2mnp - 7)$

17. $-3s^2y(-2s^4y^2 + 3sy^3 + 4)$

18. $(c + 2)(c + 8)$

19. $(z - 7)(z + 4)$

20. $(a - 5)^2$

21. $(2x - 3)(3x - 5)$

22. $(r - 2s)(r + 2s)$

23. $(3y + 4)(2y - 3)$

24. $(3 - 2b)(3 + 2b)$

25. $(3w + 1)^2$

5-2 Practice

Polynomials

Determine whether each expression is a polynomial. If it is a polynomial, state the degree of the polynomial.

1. $5x^3 + 2xy^4 + 6xy$

2. $-\frac{4}{3}ac - a^5d^3$

3. $\frac{12m^8n^9}{(m-n)^2}$

4. $25x^3z - x\sqrt{78}$

5. $6c^{-2} + c - 1$

6. $\frac{5}{r} + \frac{6}{s}$

Simplify.

7. $(3n^2 + 1) + (8n^2 - 8)$

8. $(6w - 11w^2) - (4 + 7w^2)$

9. $(-6n - 13n^2) + (-3n + 9n^2)$

10. $(8x^2 - 3x) - (4x^2 + 5x - 3)$

11. $(5m^2 - 2mp - 6p^2) - (-3m^2 + 5mp + p^2)$

12. $(2x^2 - xy + y^2) + (-3x^2 + 4xy + 3y^2)$

13. $(5t - 7) + (2t^2 + 3t + 12)$

14. $(u - 4) - (6 + 3u^2 - 4u)$

15. $-9(y^2 - 7w)$

16. $-9r^4y^2(-3ry^7 + 2r^3y^4 - 8r^{10})$

17. $-6a^2w(a^3w - aw^4)$

18. $5a^2w^3(a^2w^6 - 3a^4w^2 + 9aw^6)$

19. $2x^2(x^2 + xy - 2y^2)$

20. $-\frac{3}{5}ab^3d^2(-5ab^2d^5 - 5ab)$

21. $(v^2 - 6)(v^2 + 4)$

22. $(7a + 9y)(2a - y)$

23. $(y - 8)^2$

24. $(x^2 + 5y)^2$

25. $(5x + 4w)(5x - 4w)$

26. $(2n^4 - 3)(2n^4 + 3)$

27. $(w + 2s)(w^2 - 2ws + 4s^2)$

28. $(x + y)(x^2 - 3xy + 2y^2)$

29. BANKING Terry invests \$1500 in two mutual funds. The first year, one fund grows 3.8% and the other grows 6%. Write a polynomial to represent the amount Terry's \$1500 grows to in that year if x represents the amount he invested in the fund with the lesser growth rate.

30. GEOMETRY The area of the base of a rectangular box measures $2x^2 + 4x - 3$ square units. The height of the box measures x units. Find a polynomial expression for the volume of the box.

Determine whether each expression is a polynomial. If it is a polynomial, state the degree of the polynomial.

1. $x^2 + 2x + 2$ **yes; 2**

2. $\frac{b^2c}{d^4}$ **no**

3. $8xz + \frac{1}{2}y$ **yes; 2**

Simplify.

4. $(g + 5) + (2g + 7)$
 $3g + 12$

5. $(5d + 5) - (d + 1)$
 $4d + 4$

6. $(x^2 - 3x - 3) + (2x^2 + 7x - 2)$
 $3x^2 + 4x - 5$

7. $(-2f^2 - 3f - 5) + (-2f^2 - 3f + 8)$
 $-4f^2 - 6f + 3$

8. $(4r^2 - 6r + 2) - (-r^2 + 3r + 5)$
 $5r^2 - 9r - 3$

9. $(2x^2 - 3xy) - (3x^2 - 6xy - 4y^2)$
 $-x^2 + 3xy + 4y^2$

10. $(5t - 7) + (2t^2 + 3t + 12)$
 $2t^2 + 8t + 5$

11. $(u - 4) - (6 + 3u^2 - 4u)$
 $-3u^2 + 5u - 10$

12. $-5(2c^2 - d^2)$
 $-10c^2 + 5d^2$

13. $x^2(2x + 9)$
 $2x^3 + 9x^2$

14. $2q(3pq + 4q^4)$
 $6pq^2 + 8q^5$

15. $8w(hk^2 + 10h^3m^4 - 6k^5w^3)$
 $8hk^2w + 80h^3m^4w - 48k^5w^4$

16. $m^2n^3(-4m^2n^2 - 2mnp - 7)$
 $-4m^4n^5 - 2m^3n^4p - 7m^2n^3$

17. $-3s^2y(-2s^4y^2 + 3sy^3 + 4)$
 $6s^6y^3 - 9s^3y^4 - 12s^2y$

18. $(c + 2)(c + 8)$
 $c^2 + 10c + 16$

19. $(z - 7)(z + 4)$
 $z^2 - 3z - 28$

20. $(a - 5)^2$
 $a^2 - 10a + 25$

21. $(2x - 3)(3x - 5)$
 $6x^2 - 19x + 15$

22. $(r - 2s)(r + 2s)$
 $r^2 - 4s^2$

23. $(3y + 4)(2y - 3)$
 $6y^2 - y - 12$

24. $(3 - 2b)(3 + 2b)$
 $9 - 4b^2$

25. $(3w + 1)^2$
 $9w^2 + 6w + 1$

5-2 Practice (Average)**Polynomials**

Determine whether each expression is a polynomial. If it is a polynomial, state the degree of the polynomial.

1. $5x^3 + 2xy^4 + 6xy$ **yes; 5** 2. $-\frac{4}{3}ac - a^5d^3$ **yes; 8** 3. $\frac{12m^8n^9}{(m-n)^2}$ **no**
 4. $25x^3z - x\sqrt{78}$ **yes; 4** 5. $6c^{-2} + c - 1$ **no** 6. $\frac{5}{r} + \frac{6}{s}$ **no**

Simplify.

7. $(3n^2 + 1) + (8n^2 - 8)$
 $11n^2 - 7$
 8. $(6w - 11w^2) - (4 + 7w^2)$
 $-18w^2 + 6w - 4$
 9. $(-6n - 13n^2) + (-3n + 9n^2)$
 $-9n - 4n^2$
 10. $(8x^2 - 3x) - (4x^2 + 5x - 3)$
 $4x^2 - 8x + 3$
 11. $(5m^2 - 2mp - 6p^2) - (-3m^2 + 5mp + p^2)$
 $8m^2 - 7mp - 7p^2$
 12. $(2x^2 - xy + y^2) + (-3x^2 + 4xy + 3y^2)$
 $-x^2 + 3xy + 4y^2$
 13. $(5t - 7) + (2t^2 + 3t + 12)$
 $2t^2 + 8t + 5$
 14. $(u - 4) - (6 + 3u^2 - 4u)$
 $-3u^2 + 5u - 10$
 15. $-9(y^2 - 7w)$
 $-9y^2 + 63w$
 16. $-9r^4y^2(-3ry^7 + 2r^3y^4 - 8r^{10})$
 $27r^5y^9 - 18r^7y^6 + 72r^{14}y^2$
 17. $-6a^2w(a^3w - aw^4)$
 $-6a^5w^2 + 6a^3w^5$
 18. $5a^2w^3(a^2w^6 - 3a^4w^2 + 9aw^6)$
 $5a^4w^9 - 15a^6w^5 + 45a^3w^9$
 19. $2x^2(x^2 + xy - 2y^2)$
 $2x^4 + 2x^3y - 4x^2y^2$
 20. $-\frac{3}{5}ab^3d^2(-5ab^2d^5 - 5ab)$
 $3a^2b^5d^7 + 3a^2b^4d^2$
 21. $(v^2 - 6)(v^2 + 4)$
 $v^4 - 2v^2 - 24$
 22. $(7a + 9y)(2a - y)$
 $14a^2 + 11ay - 9y^2$
 23. $(y - 8)^2$
 $y^2 - 16y + 64$
 24. $(x^2 + 5y)^2$
 $x^4 + 10x^2y + 25y^2$
 25. $(5x + 4w)(5x - 4w)$
 $25x^2 - 16w^2$
 26. $(2n^4 - 3)(2n^4 + 3)$
 $4n^8 - 9$
 27. $(w + 2s)(w^2 - 2ws + 4s^2)$
 $w^3 + 8s^3$
 28. $(x + y)(x^2 - 3xy + 2y^2)$
 $x^3 - 2x^2y - xy^2 + 2y^3$
 29. **BANKING** Terry invests \$1500 in two mutual funds. The first year, one fund grows 3.8% and the other grows 6%. Write a polynomial to represent the amount Terry's \$1500 grows to in that year if x represents the amount he invested in the fund with the lesser growth rate. **$-0.022x + 1590$**
 30. **GEOMETRY** The area of the base of a rectangular box measures $2x^2 + 4x - 3$ square units. The height of the box measures x units. Find a polynomial expression for the volume of the box. **$2x^3 + 4x^2 - 3x$ units³**